

What is claimed is:

1. A water circulation cleaner, comprising:

a main case;

5 a suction head combined to the lower side of the main case, having a suction port to suck foreign materials and fluid existing on a cleaning object surface;

an impeller assembly installed at one side of the main case, for generating suction force;

10 a filter means positioned in the suction passage between the suction head and the impeller assembly, for separating foreign materials contained in suction fluid;

a cleaning water tank connected to the discharging port of the impeller assembly in the main case, for storing cleaning water inside; and

15 an injection nozzle positioned in the suction head, for injecting the cleaning water supplied from the cleaning water tank to the cleaning object surface.

2. The cleaner of claim 1, wherein rollers are installed at the front and rear sides of the lower surface of the suction head to ease moving of the cleaner.

3. The cleaner of claim 1, wherein the suction head has either a brush member or duster member to remove foreign materials being abutted to the  
25 cleaning object on the lower surface.

4. The cleaner of claim 3, wherein the brush member and duster member are composed to remove foreign materials from the cleaning object.

5 5. The cleaner of claim 1, wherein the suction head has a blade for preventing outflow of the cleaning water injected from the injection nozzle in the outer area of the suction port.

10 6. The cleaner of claim 5, wherein the blade has a structure that it is connected to the lower surface of the suction head in the trapezoid form.

15 7. The cleaner of claim 6, wherein the suction head has either a brush member or duster member to remove foreign materials being abutted to the cleaning object on the lower surface and the suction port is formed at the upper and rear side of the portion where the brush member and the duster are installed.

20 8. The cleaner of claim 7, wherein the injection nozzle is positioned between the suction port positioned at the front and the brush member or the duster member.

9. The cleaner of claim 5, wherein the blade has a oval structure that it is connected to the lower surface of the suction head.

25 10. The cleaner of claim 9, wherein the suction port is formed as an oval shape in the internal area of the blade.

11. The cleaner of claim 10, wherein at least one between the brush member or duster member is installed at the inner side area of the suction port.

5 12. The cleaner of claim 10, wherein the plurality of injection nozzles are formed between the suction port and the brush member or duster member.

10 13. The cleaner of claim 5, wherein the blade has an end blade abutted to the bottom surface formed sloped inward where the suction port is positioned.

15 14. The cleaner of claim 1, wherein the suction pipe for forming a suction passage between the suction head and the filter means is connected and a backward-flow-preventing valve for preventing a backward flow so that the cleaning water does not move backwardly.

15. The cleaner of claim 14, wherein the suction pipe has an expansion pipe expanded in the direction of the radius in the middle of itself.

20 16. The cleaner of claim 1, wherein the filter means is combined with the impeller assembly outside the main case.

17... The cleaner of claim 1, wherein the filter means is composed of the hydro-cyclone dust collection structure.

18. The cleaner of claim 17, wherein the filter means is composed of a dust collection case having a radius narrowed along from the upper area to the lower area to form a cyclone dust collection structure by gyration movement of fluid.

5

19. The cleaner of claim 18, wherein the dust collection case has a protrusion port for sucking the cleaning water containing foreign materials on the upper side surface and an impeller suction tube vertically lengthened from the impeller assembly at the upper central portion

10

20. The cleaner of claim 19, wherein the protrusion port is protruded in the direction of tangent line of the dust collection case from a flat surface.

21. The cleaner of claim 19, wherein the protrusion port is formed sloped downward in the direction to the inner side of the dust collecting case.

15

22. The cleaner of claim 1, wherein the filter means has a filter member in a filter case and accordingly when cleaning water sucked to the filter case passes the filter member, foreign material is filtered.

20

23. The cleaner of claim 22, wherein the filter means comprises:  
a filter case having a protrusion port on the side surface to suck cleaning water;

a cap where an impeller suction pipe of the impeller assembly passes,  
being combined at the upper portion of the filter case separably; and

25

a filter member for filtering foreign materials.

24. The cleaner of claim 22, wherein the filter member comprises:

a first filter member positioned at the inner lower portion of the filter case,  
5 having a relatively small number of meshes to filter foreign materials with large particles; and

a second filter member positioned at the side of the impeller suction pipe, having a relatively large number of meshes than the first filtering member to filter foreign materials with small particles.

25. The cleaner of claim 1, wherein the impeller assembly comprises:

an impeller housing fixed to the main case;

an impeller for generating a force for flowing cleaning water containing foreign materials which passed through the filter means at the lower inner portion  
15 of the impeller housing; and

a driving motor installed at the upper inner portion of the impeller housing, for rotary operating the impeller.

26. The cleaner of claim 25, wherein the impeller assembly further  
20 comprises:

a sealing means positioned between the impeller and the driving motor, for preventing inflow of the cleaning water to the driving motor.

27. The cleaner of claim 1, wherein the cleaning water tank is formed  
25 in a cylindrical shape lengthened in the vertical direction, being connected with an

inflow tube connected to the impeller assembly and an outflow tube connected to the injection nozzle.

28. The cleaner of claim 27, wherein the inflow tube has a pressure  
5 drawing means for lowering pressure by being opened when pressure between the exhaust side area of the impeller assembly and the cleaning water tank reaches a certain level.

29. The cleaner of claim 28, wherein the pressure drawing tube  
10 comprises:

a pressure drawing tube diverged from the inflow tube and connected to the outside of the main case; and

a pressure valve installed in the pressure drawing tube, being opened when the pressure reaches a certain level.

15

30. The cleaner of claim 27, wherein an open/close valve for opening and closing the tank is installed in the outflow tube to prevent outflow of the cleaning water stored in the cleaning water tank.

20

31. The cleaner of claim 1, wherein a supply tube communicating with the outside of the main case is connected to the cleaning water tank to fill the tank with cleaning water and a cap is installed in the inlet portion of the supply tube to close the cleaning water tank.

25